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EXAMINER

OLSEN, KAJ K

ART UNIT PAPER NUMBER

1753

DATE MAILED: 10/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/715,489

Applicant(s)

FILANOVSKY, BORIS

Examiner

Kaj K. Olsen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 July 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 26-45 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 45 is/are allowed.
- 6) ☒ Claim(s) 26-34 and 37-43 is/are rejected.
- 7) ☐ Claim(s) 35, 44 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Objections***

1. On applicant's latest amendment, the previous claim 27 has inexplicably become claim 17. For the purpose of expediting prosecution, the examiner will not issue a further notice of non-compliance and will presume that applicant's listed claim 17 is actually claim 27.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 39-43 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. On applicant's latest amendment, claim 39 is now dependent on itself. Reviewing the applicant's previous non-compliant amendment, claim 39 then depended from claim 37. For the purpose of examination, the examiner will presume that claim 39 should depend from claim 37, but clarification and correction is required.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 26, 29, 30, 33, 37, and 39-41 are rejected under 35 U.S.C. 102(a) as being anticipated by Niu et al (J. Electroanalytical Chem. 546, pp. 59-72, 2003). Niu is being cited and relied on for the first time with this office action. Its use here was necessitated by applicant's new claims.

7. Niu discloses a working electrode having a surface that has been modified by a monomeric amino-aromatic compound (i.e. aniline) that have been dissolved organic polar solvents such as ethanol, propanol and acetonitrile. See p. 61, first column, second full paragraph and the first paragraph of section 3.1 on p. 62. With respect to this working electrode being for a system for electrochemical assay of nitro-aromatic compounds, that is only the intended use of the apparatus and the intended use need not be given further due consideration in determining patentability.

8. With respect to the solvent being aprotic, these various solvents above inherently are aprotic.

9. With respect to the use of an electrolyte comprising organic solvent and water mixtures, see fig. 2, 5, 7, 8, section 3.1 and table 2 for examples. Because the electrolyte meets the defined composition of the claims, it is presumed that it would be capable of dissolving nitro-aromatic compounds.

10. Claims 26, 27, 30, 33, 37 and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Malinauskas et al (J. Electroanalytical Chem. 484 (2000), pp. 55-63 with evidence from the

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STN Registry. Malinauskas is being cited and relied on for the first time with this office action.

Its use was necessitated by the applicant's amendment to the claims.

11. Malinauskas discloses a working electrode having a surface that has been modified by a monomeric amino-aromatic compound (i.e. Toluidine Blue (TB)) that has been dissolved in an organic polar solvent of ethanol. See first sentence of the abstract and the STN Registry index for TB. With respect to this working electrode being for a system for electrochemical assay of nitro-aromatic compounds, that is only the intended use of the apparatus and the intended use need not be given further due consideration in determining patentability.

12. The STN registry index also evidences that TB comprises in part an alkyl-aniline compound. That is, both sides of the molecule comprise an aminobenzene unit (i.e. aniline) that have been modified by one or two methyl units.

13. With respect to the solvent being aprotic, ethanol is inherently aprotic.

14. With respect to the electrode composition, the electrodes of Malinauskas are carbon.

15. With respect to the electrolyte, Malinauskas performs experiments in a Tris buffer solution. See 2. Experimental on p. 56. Tris buffer is a mixture of water and organic solvent of tris (hydroxymethyl) aminomethane. Because the electrolyte meets the defined composition of the claims, it is presumed that it would be capable of dissolving nitro-aromatic compounds.

16. With respect to the presence of a mechanism for inputting a gas, Malinauskas discloses bubbling argon gas through the electrolyte solution. See p. 57, col. 1. This would read on applicant's defined mechanism giving the claim language its broadest reasonable interpretation. What applicant intends to utilize the mechanism for (i.e. inputting air suspected of containing nitro-aromatic compounds) constitutes the intended use of the mechanism.

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17. Claims 26 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Levi et al (Electrochimica Acta, 38, pp. 271-279, 1993). Levi is being cited and relied on for the first time with this office action. Its use here was necessitated by the new claims.

18. Levi discloses a working electrode that is exposed to a monomeric solution of amino-aromatic compound (N-phenyl-p-phenylenediamine (NPPD)) dissolved in an organic solvent of acetonitrile. See fig. 1, especially the caption. With respect to this compound modifying the surface of the electrode, the examiner notes that the instant invention relied on the mere short-term exposure of the electrode to a solution of nitro-aromatic species, like phenylene diamine. See p. 8, 11.19-21. Hence the mere short-term exposure of electrodes to solutions like those of Levi before polymerization would apparently meet the claimed modification. With respect to this working electrode being for a system for electrochemical assay of nitro-aromatic compounds, that is only the intended use of the apparatus and the intended use need not be given further due consideration in determining patentability.

19. Claims 26, 27, 30 and 31 are rejected under 35 U.S.C. 102(b) as being anticipated by CAPLUS abstract for Kitani et al (Molecular Crystals and Liquid Crystals, 1997, 296, pp. 349-356).

20. Kitani discloses a working electrode (i.e. the electrode for the electrochemical polymerization) that is exposed to a monomeric solution of amino-aromatic compound (e.g. polyheptylaniline) dissolved in an organic solvent containing acetonitrile or DMSO. See the abstract and index of terms. With respect to this compound modifying the surface of the electrode, the examiner notes that the instant invention relied on the mere short-term exposure of the electrode to a solution of nitro-aromatic species, like alkyilanilines. See p. 8, 11.19-21. Hence

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the mere short-term exposure of electrodes to solutions like those of Kitani before polymerization would apparently meet the claimed modification. With respect to this working electrode being for a system for electrochemical assay of nitro-aromatic compounds, that is only the intended use of the apparatus and the intended use need not be given further due consideration in determining patentability.

***Claim Rejections - 35 USC § 103***

21. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

22. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Levi.

23. Levi set forth all the limitations of the claims, but did not explicitly disclose the presence of one of the three specified compounds. Rather, Levi relied on a substituted phenylene-diamine (i.e. NPPD) that the examiner is interpreting as not reading of the claimed phenylene-diamine. However, Levi earlier recognized that polymers made of unsubstituted phenylene-diamines (i.e. o-phenylenediamine) also garnered considerable interest in the studies of redox polymers. See the Introduction. One possessing ordinary skill in the art would have been motivated to utilize the experiment Levi performed with NPPD with o-phenylenediamine as a monomer so as to determine the mechanism of electron transfer for poly-o-phenylenediamine as well. The mere recognition that the experiment of Levi could have also been performed with an unsubstituted form of phenylene-diamine requires only routine skill in the art.

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24. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over any of Niu, Malinauskas, Levi or Kitani.

25. The references set forth all the limitations of the claim, but did not explicitly recite the use of the specified monomeric amino-aromatic concentrations. However, varying the level of amino-aromatic concentrations in order to determine the absorptive characteristics of the electrode (Niu), arrive at the desired mediator concentration (Malinauskas) or polymer concentration (Levi or Kitani) requires only routine skill in the art.

26. Claims 34 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niu or Malinauskas in view of Bennetto et al (USP 4,970,145).

27. The references set forth all the limitations of the claim 34, but did not explicitly recite the use of submicron particles. However, Niu is constructed out of high surface area carbon (see Introduction) and Malinauskas is constructed out of graphite powder (see Experimental). Bennetto discloses carbon powders utilized in the electrode art are conventionally submicron in size. See col. 6, 11.6-14. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Bennetto for the electrodes of Niu or Malinauskas because the use of conventional sized carbon particles already known from the electrode art requires only routine skill in the art.

28. With respect to claim 36, Bennetto also teaches that carbon paper is a conventional form of carbon that finds utility throughout the electrode arts. See the abstract.

29. Claims 42 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niu.

30. Niu sets forth all the limitations of the claims, but does not specify a pH for the electrolyte. However, the device of Niu is being utilized for organic pollutants in waste-waters



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(see Introduction). It would have been obvious to one of ordinary skill in the art at the time the invention was being made to test the electrode of Niu in different solution pHs (including pHs greater than 7 or 8) in order to determine if the ability of the electrode to absorb organic pollutants is either improved or degraded as a function of pH.

***Allowable Subject Matter***

31. Claims 35 and 44 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

32. Claim 45 is allowed.

33. The following is a statement of reasons for the indication of allowable subject matter:

With respect to claim 35, the prior art does not disclose nor render obvious all the limitations of claim 26 and further comprising where gold is deposited on carbon with an average thickness of less than one nanometer. With respect to claim 44, the prior art does not disclose nor render obvious all the limitations of claim 26 and further comprising an electrolyte comprising a water buffer of pH greater than 8, ethanol and acetonitrile. With respect to claim 45, the prior art does not disclose all the cumulative limitations of the claims with particular attention to a working electrode having a surface of carbon and gold with the set forth modified surface for the electrode.

***Response to Arguments***

34. Applicant's arguments with respect to claims 26-45 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

35. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaj Olsen whose telephone number is (571) 272-1344. The examiner can normally be reached on Monday through Friday from 8:00 A.M. to 4:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen, can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AU 1753  
September 28, 2006



**KAJ K. OLSEN**  
**PRIMARY EXAMINER**